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REPORT TO INJURY SCALING COMMITTEE PRESENTED TO INTERNATIONAL WORKSHOP ON  
HUMAN SUBJECTS AND BIOMEDICAL RESEARCH BY JOHN D. STATES, M.D.  
10/22/76

1. Liaison with the Injury Scaling Committee of the American Association for Automotive Medicine, the Society of Automotive Engineers and the American Medical Association is essential to maintain the clinical perspectives of cadaver injury scaling. Dr. J. States, Dr. D. Huelke and Dr. J. Melvin are members of both committees and will insure future liaison.
2. The Abbreviated Injury Scale has achieved worldwide acceptance by accident investigation teams. It is being increasingly used in cadaver and animal experimental impact research.
3. The current revision of the Abbreviated Injury Scale was published in February 1976 and is available from the American Association for Automotive Medicine.

Codes 7, 8 and 9 have been dropped and death is no longer a consideration in scaling because of the variable response of various patients. AIS 6 has been redefined as "currently untreatable injuries of maximum severity". Examples are transection of the neck and crush injury of the head. The Injury Severity Score (ISS) is suggested as a substitute for the Overall AIS. It is recommended that both be used at the present time.

4. A representative of the Injury Scaling Committee, (Dr. John D. States) met with the Neurotraumatology Committee of the World Federation of Neurosurgical Societies on September 20-21, 1976 in Brussels, Belgium to develop and improve the head injury scale. In the past year, committee members were asked to submit proposals for scaling of trauma. A consensus was tentatively reached but final approval has not been granted. When such approval is obtained, the scale will be submitted to the Injury Scaling Committee for consideration as a substitute for the present head injury scale. It is noted that Dr. John Bull, Birmingham, England stated that the present AIS head injury scale correlates well with mortality in his accident investigation studies.
5. Impact injury autopsy guidelines, under consideration for experimental cadaver impact studies, may be useful in the National Accident Surveillance System (NASS). The NASS is to become a nationwide accident surveillance system in which an estimated 2000 fatalities will be recorded each year. Standardized autopsy procedures based on the Armed Forces Institute of Pathology protocol will be used. Unautopsied fatalities should be listed as unknown because the specific cause of death is undetectable by any means other than autopsy. Coroners examinations are inadequate and misleading.
6. Experimental impact injury scaling in cadavers - The AIS is a clinical ranking of injuries by severity using three criteria principally; energy dissipation, threat-to-life and permanent impairment. The individual criteria are given variable weights depending on the particular diagnosis; ie, energy dissipation is a major consideration in the diagnosis of distraction fractures of the lumbar caused by jack-knifing over lapbelt. In contrast, permanent impairment is a consideration in lacerations of the eye which require little energy and are not a serious threat-to-life but cause blindness, a profound permanent impairment. The specific criteria are defined and discussed in the 1976 revision of the AIS and must be a constant consideration in developing an injury scale for

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experimental impact injuries in cadavers.

Review of experimental evidence and accident investigation studies suggest that the ribs and probably the long bones are more fragile in a cadaver than in the live conscious subject. This may be entirely due to the role of the active functioning musculature, particularly the diaphragm, the intercostal muscles and the abdominal muscles in protecting the ribs through direct load transfer and chest pressurization. The heart and lungs appear to be more resistant to injury in the cadaver but the terminal event leading to death of a cadaver may significantly affect this, ie, pericarditis due to septicemia, pneumonia and lung abscesses, possibly pulmonary embolus. The abdominal contents and the brain appear variable. In the future, it is expected that calibration factors can be developed but specific ones for each tissue and organ may be necessary.

Medical and developmental histories and anthropometric data of cadavers will be necessary to supplement calibration factors. Medical histories should include significant past illnesses such as rheumatoid arthritis, degenerative arthritis, polio, tuberculosis of the skeletal system, congenital and developmental conditions of the musculo-skeletal system and major past injuries, particularly fractures, and a detailed history of the terminal illness or injury. Anthropometric data should include height, weight and some assessment of the relative size and development of the musculo-skeletal system. A developmental history to include sports and occupational activities which could have a bearing on the development of the musculo-skeletal system should also be included.

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